

**A New Species of Marmoset, Genus *Callithrix* Erxleben, 1777
(Callitrichidae, Primates), from Western Brazilian Amazonia**

Stephen F. Ferrari^{1 2}
Maria Aparecida Lopes^{1 3}

ABSTRACT — The blacked-headed marmoset *Callithrix nigriceps*, sp.n., from the Lago dos Reis, municipality of Humaitá, Amazonas, Brazil, is described. A comparison with other bare-eared marmosets is presented. The limits of the new species's distribution are discussed in relation to those of other callitrichids. Notes on the conservation status of the new species are also presented.

KEY WORDS: *Callithrix nigriceps*, sp.n., primates, Callitrichidae, marmoset, Brazilian Amazonia.

RESUMO — Descreve-se o sagüi-de-cabeça-preta *Callithrix nigriceps*, sp.n., proveniente do Lago dos Reis, município de Humaitá, Amazonas, Brasil. Uma comparação com outros sagüis de orelha nua é apresentada. Os limites da distribuição da nova espécie são discutidos em relação àqueles de outros calitriquídeos. Algumas notas sobre o estado de conservação da nova espécie também são apresentadas.

PALAVRAS-CHAVE: *Callithrix nigriceps*, sp.n., primates, Callitrichidae, sagüi, Amazônia brasileira.

¹ Museu Paraense Emílio Goeldi — CNPq, Departamento de Zoologia, C.P. 399, CEP 66.040 Belém, Pará, Brasil.

² Bolsista de Desenvolvimento Científico Regional — CNPq.

³ Bolsista de Mestrado — CNPq.

INTRODUCTION

The taxonomy of the marmosets, genus *Callithrix* Erxleben 1777, has undergone two major revisions during the past fifteen years (Hershkovitz, 1977; de Vivo, 1988). Hershkovitz (1977) identifies two Amazonian species, *Callithrix argentata* and *Callithrix humeralifer*, each with three subspecies, whereas de Vivo (1988) assigns species status to all six of these (*C. argentata*, *Callithrix chrysoleuca*, *C. humeralifera*, *Callithrix intermedia*, *Callithrix leucippe* and *Callithrix melanura*), in addition to reinstating the *emiliae* form to full species status.

Originally described as a species (Thomas, 1920), *emiliae* has been seen as a subspecies of *C. argentata* (Cruz Lima, 1944) and synonymized with *C. a. argentata* (Ávila-Pires, 1969), a classification accepted by Hershkovitz (1977), but later reverted by Ávila-Pires (1986). Having examined new specimens from Rondônia and Amazonas, de Vivo (1985, 1988) returned to the original specific status. *C. emiliae* is also accepted as a valid taxon by Mittermeier et al. (1988).

The classification of de Vivo (1988) is based on a detailed quantitative analysis of variation in pelage characteristics and craniometric dimensions. This analysis found no evidence of intergradation between any of the forms and, given their apparently allopatric distribution, concluded that they should be seen as true species. Mittermeier et al. (1988) also support de Vivo's classification, although were unable to include his complete revision in their paper. Given its thorough treatment of the available material, the taxonomic revision of de Vivo (1988) is followed here, thus the bare-eared marmosets constitute a group of four species, *C. argentata*, *C. emiliae*, *C. leucippe* and *C. melanura*.

Of the two westernmost forms, *C. emiliae* is known from widely-dispersed localities in the Brazilian states of Amazonas, Mato Grosso, Pará and Rondônia (de Vivo, 1985; Ávila-Pires, 1986) and the nature of its geographical distribution is not well understood, given its apparent discontinuity. The distribution of *C. melanura* is less fragmented (Hershkovitz, 1977; de Vivo, 1985), being restricted to Mato Grosso, eastern Bolivia and northern Paraguay. With the exception of records from Aripuanã (Fig. 1), the northernmost locality for this species is at 15°S in Mato Grosso (Vila Bela de Santíssima Trindade, 15°00'S, 57°41'W).

Considering the size of the region, records of Amazonian marmosets are relatively sparse and information is lacking from vast areas of Amazonas, Mato Grosso, Pará and Rondônia (Hershkovitz, 1977; de Vivo, 1988). During a recent field excursion to the region of Humaitá, Amazonas, a hitherto undescribed form of bare-eared marmoset was encountered in an area previously thought to be within the distribution of *C. emiliae*. This form, designated *Callithrix nigriceps*, sp.n., the black-headed marmoset, is described here.

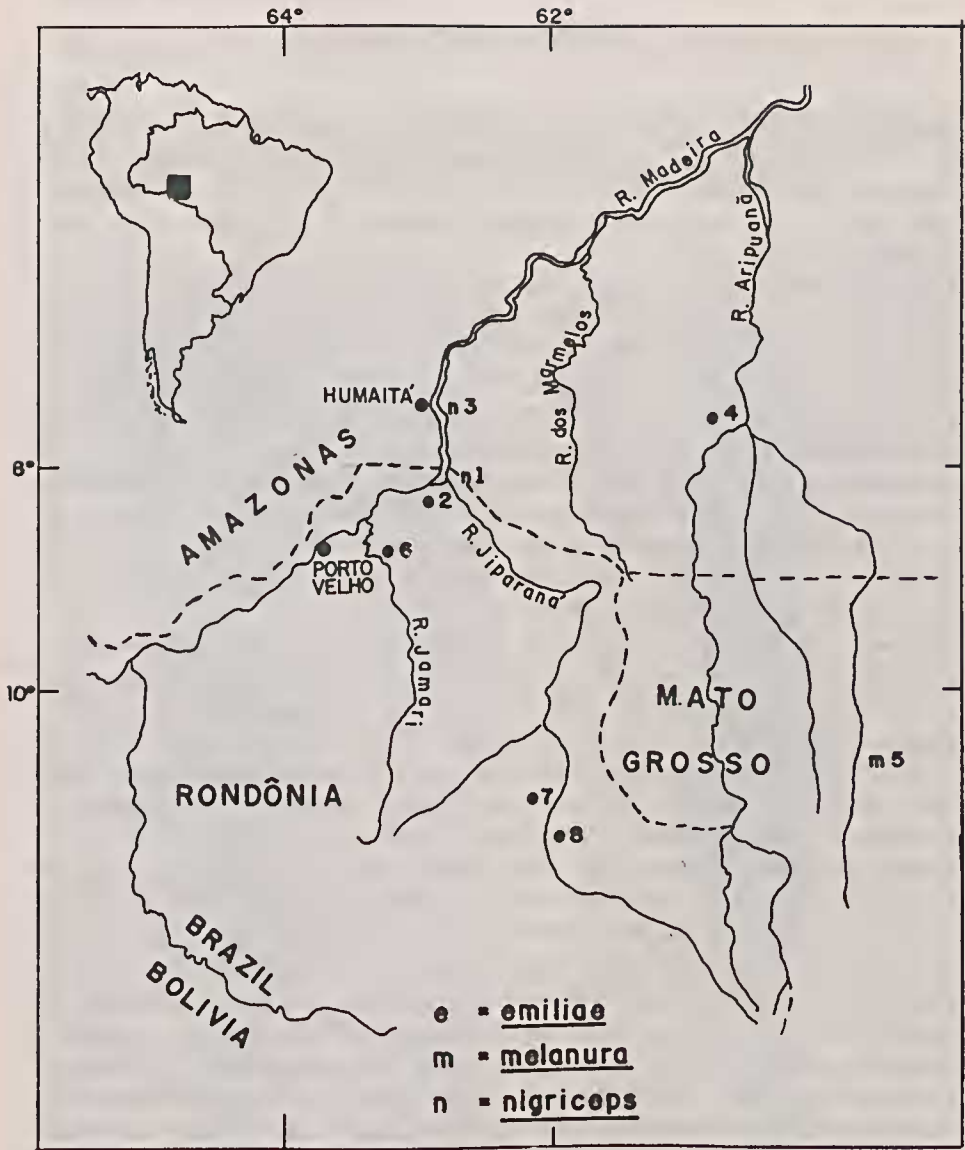


Figure 1. Collecting localities for *Callithrix emiliae*, *Callithrix nigriceps*, sp.n., and *Callithrix melanura* in Rondônia, Amazonas and northern Mato Grosso. 1: Calama, RO, east bank of Jiparaná River (08°03'S, 62°53'W); 2: Calama, RO, west bank of Jiparaná River (08°05'S, 62°53'W), Lago dos Reis, AM (07°32'S, 62°52'W); 4: Rio Castanho, AM, west bank of Rio Aripuanã (07°33'S, 60°20'W); 5: Aripuanã, MT (09°10'S, 60°38'); 6: Cachoeira Samuel, RO (08°45'S, 63°28'W); 7: Jiparaná, RO (10°52'S, 61°57'W); 8: Nova Brasília, RO (11°09'S, 61°34'W).

Callithrix nigriceps, sp.n.

Holotype: MPEG 21998, adult male, stuffed skin, complete skeleton. Collected by S. F. Ferrari, M. A. Lopes and D. Pimentel Neto on 4 September 1990 at Lago dos Reis (7°31'S, 62°52'W, = Lago Paraíso), 17 km east of Humaitá, Amazonas, Brazil, on the Trans-Amazon Highway BR-230 (right or east bank of the Madeira River).

Paratypes: MPEG 21996, adult male collected on the 3rd of September 1990, same data as holotype; MPEG 21999, adult male collected on 5 September 1990, same data as holotype; MPEG 21997, adult female, stuffed skin, complete skeleton. Collected by S. F. Ferrari, M. A. Lopes and D. Pimentel Neto on 13 September 1990 at Calama (8°03'S, 62°53'W), Rondônia, Brazil (right or east bank of Madeira River, east of Jiparaná River).

Geographical distribution: East of the Jiparaná and Madeira Rivers. The eastern limit of the distribution is unknown, but it is probably no farther east than the Rio Aripuanã, and possibly no farther east than the dos Marmelos River.

Habitat: In common with other callitrichids, *C. nigriceps*, sp.n., is apparently abundant in marginal and disturbed forest habitats.

Diagnosis: A bare-eared marmoset of the *argentata* species group (*sensu* Hershkovitz 1977). In general appearance, *nigriceps* is similar to other bare-eared marmosets, in particular the darker forms (Fig. 2). In comparison with the geographically closest form, *emiliae*, *nigriceps* differs in the pigmentation of facial skin and ears; pheomelanization (Hershkovitz 1968) of forelimbs, mantle and ventrum; dorsum brown rather than gray; orange/russet coloration of posterior members and pale coloration of hips/upper thighs.

Description of the holotype: Face thinly haired and deeply pigmented (black *in naturae*), except for the rhinarium and supra-orbital region; pigment mottled in the inter-orbital region; facial vibrissae present; forehead and crown black; cheeks blackish to grayish brown; indistinct mantle grayish brown, hairs silvery-white basally, silvery terminally; lower dorsum drab/brown, hairs pale yellow to cream basally, silvery yellow terminally; lower flank as lower dorsum except hairs yellow to orange basally; forelimb pale orange darkening distally to brownish gray and black, hairs silvery terminally; upper surface of hand black mixed with orange or brown, lower surface hairless, unpigmented (white *in naturae*); lower surface of forelimb pale yellow to orange, darkening distally; neck and chest pale cream/silvery; ventrum yellow to orange; rump dark brown to black, hairs yellow to ochraceous to red basally, yellow/creamy distally; base of tail dark brown above, reddish brown below; tail black, hairs reddish brown distally in mid section; hips and upper thighs yellow to pale orange; upper surface of hindlimb predominantly golden orange, to russet and brown distally, hairs brown to silvery yellow distally; upper surface of foot black, mixed with golden orange, lower surface hairless and unpigmented (white *in naturae*); lower surface of hindlimb

golden orange to golden russet; scrotum hairless and unpigmented (white *in naturae*).

Paratypes: The available series exhibits a small degree of individual variation in pelage coloration (color tones) and distribution of facial pigmentation (mottling). Apart from the genitalia, no sexual dimorphism is apparent.

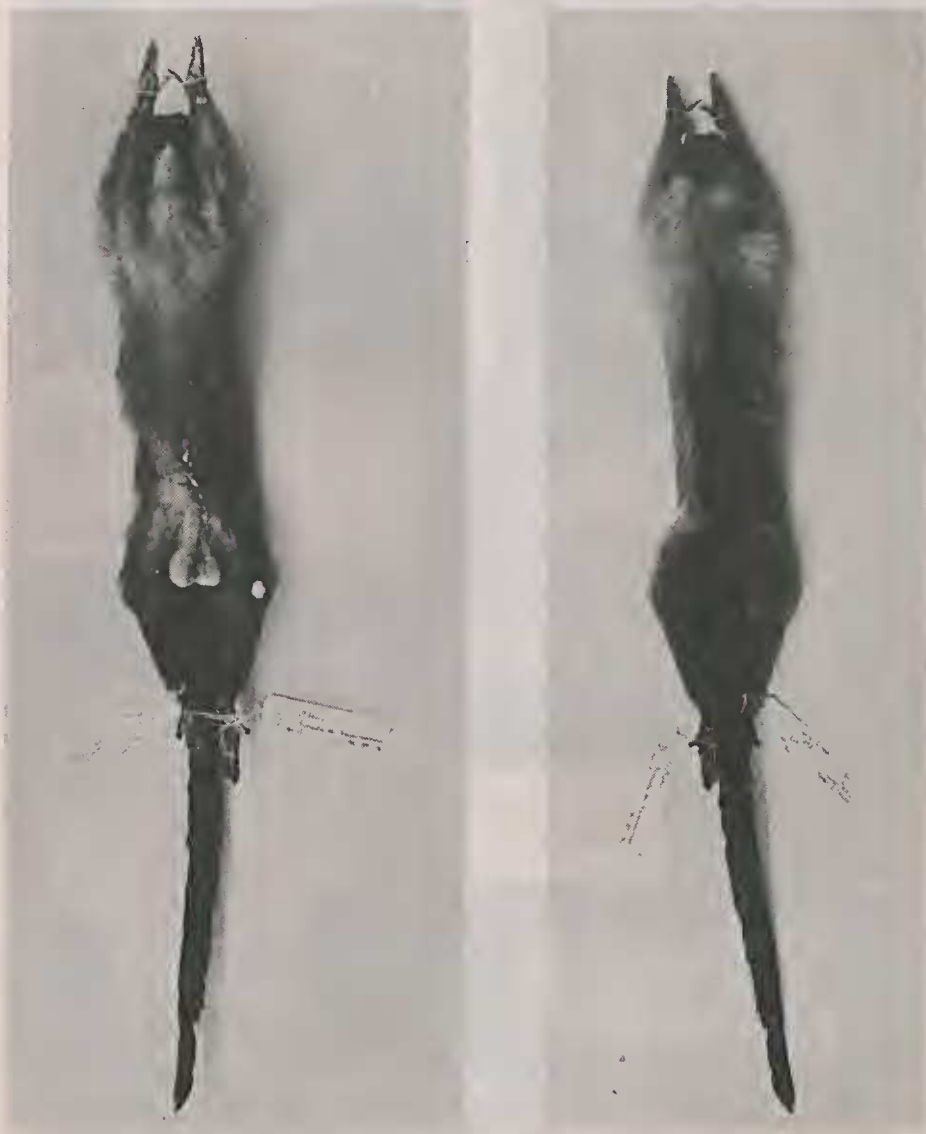


Figure 2. *Callirhix nigriceps*, sp.n., holotype (MPEG 21998).

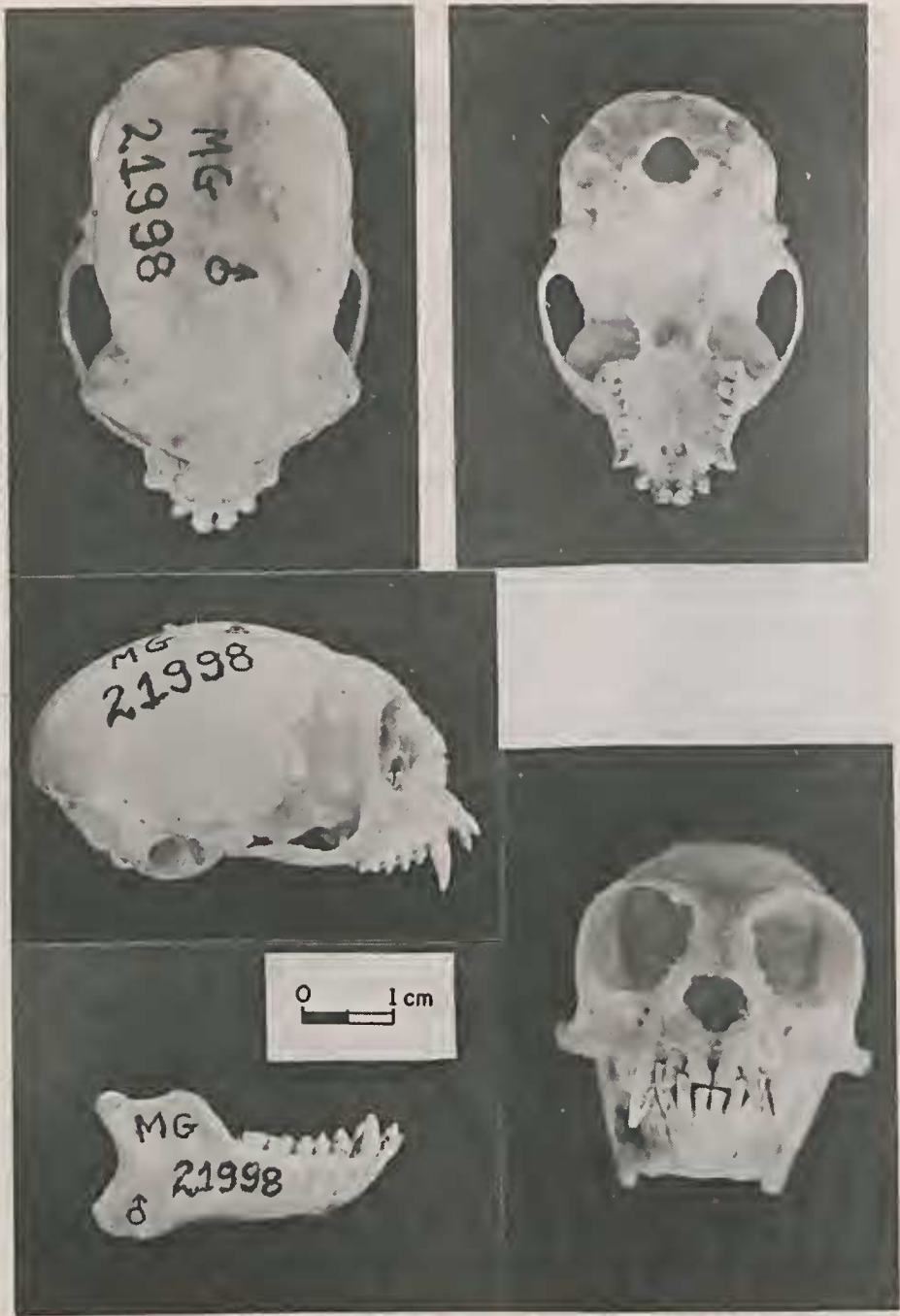


Figure 3. Cranium and mandible of *Callithrix nigriceps*, sp.n., holotype (MPEG 21998).

MEASUREMENTS AND COMPARISONS WITH OTHER BARE-EARED MARMOSETS

External and craniometric measurements (following de Vivo 1988) for the holotype (Figs. 2 and 3) and three paratypes of *C. nigriceps*, sp.n., are presented in Tables 1 and 2. With a head/body length of approximately 20 cm, tail of 32 cm and a mean weight of 370 g, *C. nigriceps*, sp.n., is typical of the genus *Callithrix* (Hershkovitz 1977, Stevenson and Rylands 1988, de Vivo 1988). In comparison with other bare-eared marmosets (Table 3), however, *C. nigriceps*, sp.n., appears to be relatively robust, being shorter-bodied but heavier. Differences in bodily proportions between the new species and the geographically closest form, *C. emiliae*, are the most striking. This robusticity is also reflected in craniometric measurements (Table 4). Mean *C. nigriceps*, sp.n., values for four measurements (zygomatic breadth, distance across molars and across canines, and dental field) are greater than those for *C. argentata*, *C. emiliae*, *C. leucippe* or *C. melanura*, suggesting a relatively broad, robust dental arcade. The remaining values, mostly linear dimensions, fall within the range recorded for the latter four species. *C. nigriceps* is most similar to the geographically closest forms (*C. emiliae* and *C. melanura*) in some dimensions, e.g. orbital breadth and dental field, but not in others and no obvious pattern is apparent from the data.

Table 1. External measurements and weights of *Callithrix nigriceps*, sp.n., holotype and paratypes.

Variable	MPEG 21998 ¹	MPEG 21999	MPEG 21996	MPEG 21997
Body weight (g)	400	330	380	390
Length (mm) of:				
Body (bregma-ischium)	193	205	220	207
Tail	314	327	320	316
Fore-arm	52	51	55	52
Foot	66	64	65	66
Ear	31	28	30	28

¹ Holotype.



The number of *C. nigriceps*, sp.n., specimens is too small to allow a detailed analysis of variability within the species group at the present time, although the available data indicate that the new species may be relatively robust in comparison with other bare-eared marmosets, and may be somewhat distinct from the geographically closest form, *C. emiliae*.

Table 2. Craniometric measurements of *Callithrix nigriceps*, sp.n., holotype and paratypes.

Measurement ¹ (mm)	Specimen:			
	MPEG 21998 ²	MPEG 21999	MPEG 21996	MPEG 21997
1. Length of cranium	46.1	45.2	47.4	-
2. Condylbasal length	37.9	36.7	38.9	-
3. Zygomatic breadth	30.8	-	31.2	-
4. Braincase width	25.4	26.4	26.9	-
5. Orbital breadth	26.9	26.0	26.7	26.3
6. Across molars	17.4	15.5	16.0	15.0
7. Length of mandible	30.2	28.8	29.5	-
8. Height of articular process	15.0	14.1	14.7	15.2
9. Dental field (P ₂ -M ₂)	11.2	11.0	10.5	11.3
10. Across canines	13.7	12.3	12.0	12.5

¹ Following de Vivo (1988)

² Holotype

Table 3. A comparison of mean weights and external measurements recorded for *Callithrix nigriceps*, sp.n., with values recorded for specimens of *Callithrix argentata*, *Callithrix emiliae* and *Callithrix melanura* in the Goeldi Museum collection.

Variable:	Species:			
	<i>Callithrix nigriceps</i>	<i>Callithrix argentata</i>	<i>Callithrix emiliae</i>	<i>Callithrix melanura</i>
Body weight ¹ (g)	370.0 (3) ²	355.6 (14)	313.3 (12)	-
Length (mm) of:				
Body (bregma-ischium)	206.3 (4)	210.7 (30)	220.6 (16)	216.3(4)
Tail	319.3 (4)	326.7 (29)	310.9 (16)	320.0(4)
Foot	65.3 (4)	61.6 (29)	55.1 (16)	65.8(4)
Ear	29.3 (4)	27.8 (29)	27.8 (16)	25.5(4)

¹ Males only.

² Sample size = N.



Table 4. A comparison of the mean craniometric measurements of *Callithrix nigriceps*, sp.n., with *Callithrix argentata*, *Callithrix leucippe* and *Callithrix melanura*.

Measurement¹ (mm) / Species:

	<i>C. nigriceps</i>	<i>C. argentata</i> ²	<i>C. argentata</i> ³	<i>C. leucippe</i> ²	<i>C. melanura</i> ²	<i>C. melanura</i> ³
1.	46.2 (3) ⁴	45.7 (88)	45.4 (21)	46.1 (15)	46.8 (14)	47.3 (3)
2.	37.8 (3)	36.8 (74)	36.8 (20)	36.8 (15)	38.2 (12)	38.1 (3)
3.	31.0 (2)	30.4 (73)	29.8 (17)	30.6 (14)	30.4 (13)	30.3 (3)
4.	26.2 (3)	26.1 (83)	25.8 (22)	26.4 (16)	26.1 (14)	26.7 (3)
5.	26.5 (4)	26.2 (79)	26.1 (22)	26.3 (16)	26.7 (17)	26.5 (4)
6.	16.0 (4)	15.0 (88)	14.7 (19)	15.2 (15)	15.2 (15)	15.9 (5)
7.	29.5 (3)	28.5 (81)	27.8 (20)	28.7 (15)	28.7 (12)	29.9 (4)
8.	14.8 (4)	16.5 (71)	14.6 (20)	16.4 (14)	15.9 (7)	16.1 (5)
9.	11.0 (4)	10.1 (70)	10.2 (17)	10.1 (15)	10.3 (11)	10.7 (5)
10.	12.6 (4)	12.0 (81)	11.8 (17)	12.2 (14)	11.6 (13)	12.0 (5)

¹ Following Table 1.

² From de Vivo (1988).

³ Measurements taken from specimens in the Goeldi Museum collection.

⁴ Sample size = N.

DISTRIBUTION AND CONSERVATION STATUS OF THE NEW SPECIES

C. nigriceps, sp.n., is known from only two localities separated by a distance of little more than 50 km. The exact limits of its geographical distribution are thus unknown, although it is unlikely that it extends farther west than the Jiparaná/Madeira Rivers nor farther east than the Aripuanã/Roosevelt. Two *C. emiliae* collecting localities, Rio Castanho (Amazonas) and Nova Brasília (Rondônia), lie between these river systems (Fig. 1). *C. emiliae* is also known from three localities to the west of the Jiparaná, including the west bank opposite Calama. *C. chrysoleuca* occurs to the east of the Rio Aripuanã and *C. intermedia* to the east of the Roosevelt River. The only callitrichids on the west bank of the Madeira are tamarins of the genus *Saguinus* (Hershkovitz 1977, Ferrari and Lopes 1992).

Sympatry has not been recorded between any *Callithrix* species and if it is assumed that it does not occur between *C. emiliae* and *C. nigriceps*, sp.n., allopatry to the east of the Jiparaná may be determined by a second tributary of the Madeira. The most likely possibility would appear to be the Rio dos Marmelos, a relatively large river whose upper reaches coincide with an area of cerrado or savanna vegetation which extends as far south as the Jiparaná (Projeto Radam 1978). The combination of this river and the open habitat of the cerrado may constitute an effective barrier to the dispersal of callitrichids.

If this is confirmed, the natural range of *C. nigriceps*, sp.n., would be restricted to an area of little more than 10,000 km² between the Jiparaná/Madeira and Rio dos Marmelos. This would constitute one of the smallest ranges of any Amazonian primate species, and potentially one of the most precarious. The area can be reached by asphalted highway from Rondônia, the current focus of colonization in western Brazilian Amazonia (Fearnside 1990), and is traversed by the Trans-Amazon. Logging operations and cattle ranching have already been established along this highway, which is also used by gold prospectors working in the south of the area. While marmosets are able to adapt well to habitat disturbance in the short term, continued deforestation will eventually have a deleterious effect on the *C. nigriceps*, sp.n., population as a whole.

ACKNOWLEDGEMENTS

This study was supported by the John D. and Catherine T. MacArthur Foundation and CNPq. Specimen collection was authorized by IBAMA (special licence 1404/90-31). Special thanks are due to Dionísio Pimentel Neto and Fernando Cazarini (Projeto Rondon - Humaitá) for their assistance with the collection of material. We would also like to thank Cazuza Júnior, José Maria Cardoso, Mário de Vivo, David C. Oren, Helder Queiroz and Alexandra Krause for their help and/or advice.



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APPENDIX 1.

Specimens examined at the Goeldi Museum, Belém.

Callithrix argentata:

Pará: Altamira, Rio Xingu, male 166; Belterra, Rio Tapajós, males 269, 8982, 8983, 8986, 9200, 9201, 9203, 9206, 9207, 9208, 9212, 10024, 10025, 10026, 21375, 21378, 21383, 21388, females 916, 9852, 8984, 8985, 8987, 9202, 9204, 9205, 10021, 10022, 10023, 21377, 21380, 21385, 21387, sex unknown 6878; Cametá, Rio Tocantins, males 38, 151, 162, 163, 164, 165, 583, females 29, 156, sex unknown 157; Mararú, Rio Tapajós, male 154; Mojuí dos Campos, Rio Tapajós, males 13288, 13292, 13293, 21372, 21373, 21390, 21393, females 13291, 21389, 21394; Portel, female 336; Santarém, Rio Tapajós, males 918, 21384, 21391, females 328, 917, 961, 21386; Fazenda Taperinha, male 4777, sex unknown 4776; Vila São Brás, Rio Tapajós, female 21374; origin unknown, males 21381, 21382, 21392, 21414, female 21376.

Callithrix eniliae:

Pará: Maloca, Rio Curuá, male 170. Rondônia: Cachoeira Samuel, Rio Jamari, males 21365, 21366, 21646, 21660, 21886, 21887, 21888, 21890, 21894, 21896, 21897, females 21367, 21647, 21885, 21893, 21895.

Callithrix leucippe:

Origin and sex unknown: 10034

Callithrix melanura:

Mato Grosso: Cidade Humboldt, Rio Aripuanã, males 13289, 13290, 13295, 13296, 15266, 21395, female 15267.

